

**WHAT IS CLAIMED IS:**

1. A WCDMA transceiver, comprising:

a transmit chain having a lookup table that provides coefficients to a digital predistorter based on power indicators; and

a predistorter training circuit, coupled to said transmit chain, that employs a receive chain of said WCDMA transceiver to provide a digital compensation signal that is a function of an output of said transmit chain and employs both said power indicators and said digital compensation signal to cause said lookup table to provide alternative coefficients to said digital predistorter thereby to reduce distortion in said output.

2. The transceiver as recited in Claim 1 wherein said transmit chain comprises:

an interpolator coupled to an output of said digital predistorter;

a digital to analog converter coupled to an output of said interpolator;

a low pass filter coupled to an output of said digital to analog converter;

a quadrature modulator coupled to an output of said low pass

10 filter; and

11 an amplifier coupled to an output of said quadrature  
12 modulator.

3. The transceiver as recited in Claim 1 wherein said  
2 receive chain comprises:

3 a quadrature De-modulator;

4 a low pass filter coupled to an output of said quadrature De-  
5 modulator; and

6 an analog to digital converter coupled to an output of said  
7 low pass filter.

4. The transceiver as recited in Claim 1 wherein said  
2 predistorter training circuit comprises a coefficient update  
3 circuit to generate alternative power indicators for said lookup  
4 table.

5. The transceiver as recited in Claim 1 wherein said power  
2 indicators include both real and quadrature components.

6. The transceiver as recited in Claim 1 wherein said  
2 predistorter training circuit operates only in a training mode.

7. The transceiver as recited in Claim 1 wherein a root-  
2 raised cosine circuit provides said power indicator.

8. A method of reducing distortion in an output of a WCDMA transceiver, comprising:

employing a lookup table to provide coefficients to a digital predistorter of a transmit chain based on power indicators;

employing a receive chain of said WCDMA transceiver to provide a digital compensation signal that is a function of an output of said transmit chain; and

employing both said power indicators and said digital compensation signal to cause said lookup table to provide alternative coefficients to said digital predistorter.

9. The method as recited in Claim 8 wherein said transmit chain comprises:

an interpolator coupled to an output of said digital predistorter;

a digital to analog converter coupled to an output of said interpolator;

a low pass filter coupled to an output of said digital to analog converter;

a quadrature modulator coupled to an output of said low pass filter; and

an amplifier coupled to an output of said quadrature modulator.

10. The method as recited in Claim 8 wherein said receive  
2 chain comprises:

3 a quadrature De-modulator;

4 a low pass filter coupled to an output of said quadrature De-  
5 modulator; and

6 an analog to digital converter coupled to an output of said  
7 low pass filter.

11. The method as recited in Claim 8 wherein said employing  
2 both said power indicators and said digital compensation signal  
3 comprises generating alternative power indicators for said lookup  
4 table.

12. The method as recited in Claim 8 wherein said power  
2 indicators include both real and quadrature components.

13. The method as recited in Claim 8 wherein said employing  
2 both said power indicators and said digital compensation signal is  
3 carried out only in a training mode.

14. The method as recited in Claim 8 wherein a root-raised  
2 cosine circuit provides said power indicator.

15. A WCDMA transceiver, comprising:

a transmit chain, including:

a digital predistorter,

a lookup table that provides coefficients to said digital predistorter based on power indicators,

an interpolator coupled to an output of said digital predistorter,

a digital to analog converter coupled to an output of said interpolator,

a low pass filter coupled to an output of said digital to analog converter,

a quadrature modulator coupled to an output of said low pass filter, and

an amplifier coupled to an output of said quadrature modulator;

a receive chain, including:

a quadrature De-modulator,

a low pass filter coupled to an output of said quadrature De-modulator,

an analog to digital converter coupled to an output of said low pass filter; and

a predistorter training circuit, coupled to said transmit chain, that employs said receive chain to provide a digital

24 compensation signal that is a function of an output of said  
25 transmit chain and employs both said power indicators and said  
26 digital compensation signal to cause said lookup table to provide  
27 alternative coefficients to said digital predistorter thereby to  
28 reduce distortion in said output.

16. The transceiver as recited in Claim 15 wherein said  
2 predistorter training circuit comprises a coefficient update  
3 circuit to generate alternative power indicators for said lookup  
4 table.

17. The transceiver as recited in Claim 15 wherein said power  
2 indicators include both real and quadrature components.

18. The transceiver as recited in Claim 15 wherein said  
2 predistorter training circuit operates only in a training mode.

19. The transceiver as recited in Claim 15 wherein a root-  
2 raised cosine circuit provides said power indicator.

20. The transceiver as recited in Claim 15 wherein said  
2 transceiver is located within a cellular telephone.